

EDUCATIONAL
PACKAGE

NO.06

The biological pump



Hints

Use Internet to find answers to the above questions, but don't forget to site your information sources.

Use keywords:
- biological pump
- carbon cycle
- photosynthesis
- mineralization
- sedimentation

COMPLETE THE DIAGRAM

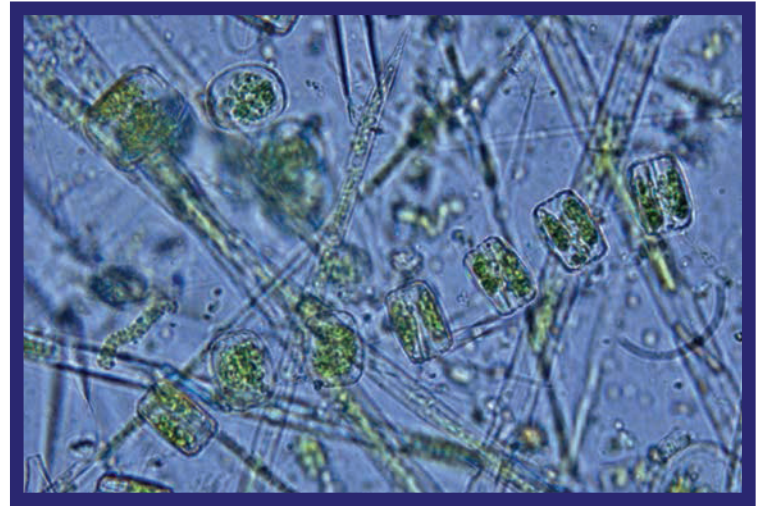
1) Complete the diagram of the biological pump:

a) Write the numbers in the appropriate blue circles:

- 1- Atmospheric carbon
- 2 - Carbon assimilated (dissolved) by photosynthesis
- 3 - Carbon transferred into marine biomass
- 4 - Surface carbon remineralized and exported to atmosphere
- 5 - Carbon exported to depth (CaCO_3)
- 6 - Carbon exported to depth (organic)

b) Place the statements in the right white circles:

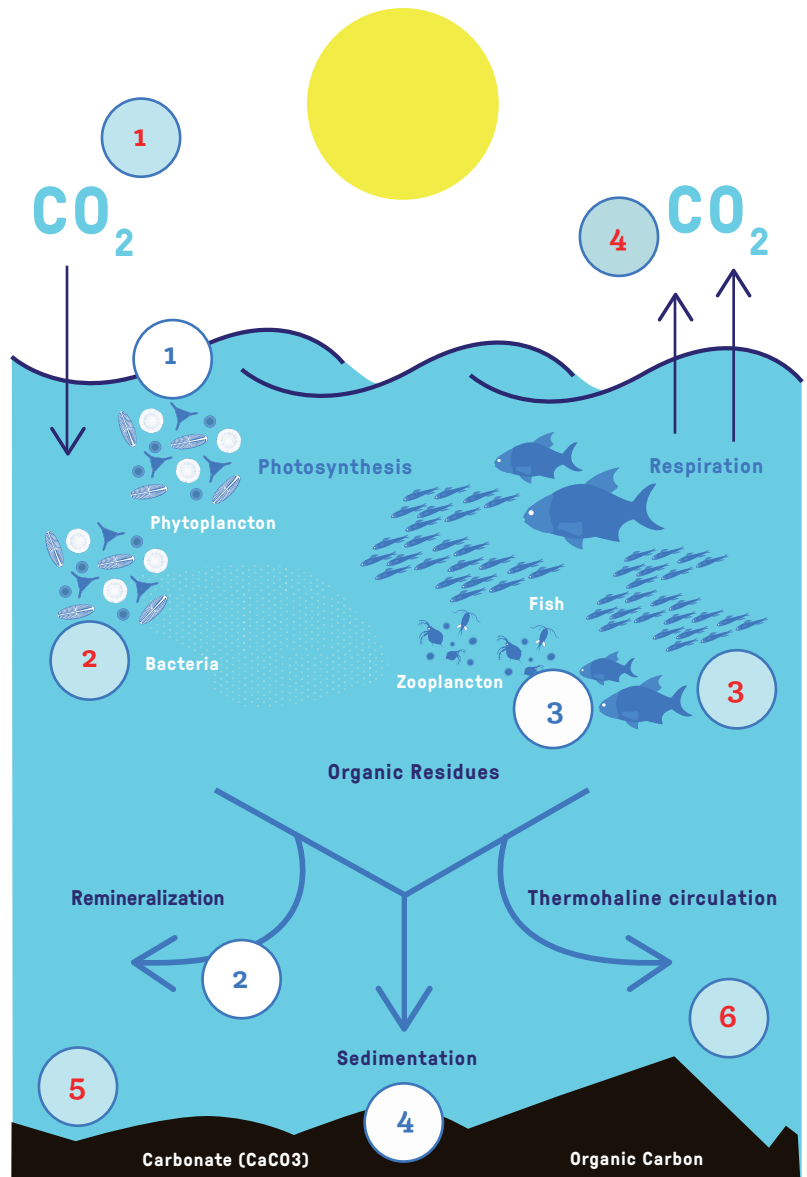
- 1 - photosynthesis:
- absorption of light energy, minerals and carbon
- production of oxygen and sugars
- 2 -Remineralization:
decomposition of phytoplankton into mineral parts
- 3 - transfer of carbon in the food chain
- 4- sedimentation of carbon in the ocean floor



Surface Ocean

Deep Ocean

Ocean Floor



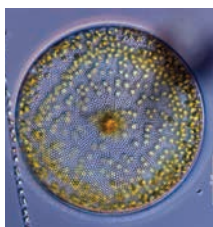
EXPLAIN IN YOUR OWN WORDS

2) Explain in your own words, the important role the biological pump plays with regard to climate regulation.

The biological pump plays an important role in climate regulation because it absorbs large quantities of atmospheric CO₂. As concentrations of this gas rise, so does average atmospheric temperature due to the greenhouse effect.

3) What unites these images?

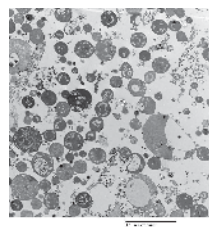
These are organisms that store carbon. Phytoplankton produces carbon through photosynthesis, Arctic cod eat phytoplankton, bacteria decompose organic matter made up of carbon and coccolithophores are composed of calcium carbonate (CaCO₃).



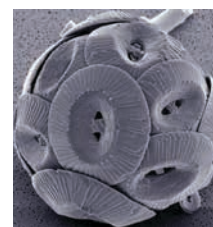
PHYTOPLANKTON



ARCTIC COD



BACTERIA



COCCOLITHOPHORE

